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IN THIS ISSUE

PRE-PEELED POTATOES PRESENT POSSIBILITIES

By "Al" E. Mercker Page 3

A possible retail market for pre-peeled raw potatoes is explored in this report on a little known but interesting development. Mr. Mercker is with PMA's Fruit and Vegetable Branch.

DEFINITE MEASUREMENTS FOR WOOL CLASSES

By E. M. Pohle Page 7

Inch measurements for staple lengths of grease wool are proposed in a summary of a report on a study made by the author, H. D. Ray, and W. T. Manning, Livestock Branch Wool Laboratory, PMA.

WHAT ABOUT GRAIN STORAGE?

By A. F. Troyer Page 9

The Deputy Director of PMA's Grain Branch answers questions on what USDA is doing to meet a tight grain storage situation.

NEW USDA CLEANER-MIXER SPEEDS COTTONSEED GRADING

By M. E. Whitten Page 12

Another invention by USDA research personnel, described by the head of the Cottonseed Section, Cotton Branch, PMA.

BUTTERMILK POWDER: A GOOD MIXER

By T. I. Hendrick Page 14

A dairy industry byproduct formerly used for livestock feed has tremendous potentialities for food use. The chemist in charge of PMA's Dairy Branch laboratory in Chicago discusses some of them.

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Pre-Peeled Potatoes Present Possibilities

By Albert E. Mercker

Harried housewives who at one time or another have dropped potatoes from their family menus because they had no time to peel them soon may not have that worry. If a widespread but little known segment of the potato trade can lick a couple of problems, housewives will be able to buy at their local grocers pre-peeled spuds ready for French frying or mashing.

And, if raw ready-to-cook potatoes can be retailed successfully, producers who have suffered constantly declining markets may have a brighter outlook. The time, labor, and clean-up problems involved in home preparation of potatoes have been considered a factor in the trend toward lower per capita potato consumption. With ready-to-use potatoes available, there is a strong possibility that they would be served more frequently at home.

There are problems, however, that even now make the sale of pre-peeled potatoes at retail an "iffy" proposition. A few earlier sorties into the retail trade were not too successful and have left some processors pessimistic. On the other hand, there are pre-peelers who feel that if they can find a suitable package, provide surer and longer refrigerated storage life, and improve sanitary techniques, they have a great potential retail market they can open through an adequate consumer education campaign. Meanwhile, both the pre-peeled potato trade and research specialists of the U. S. Department of Agriculture are optimistically working on solutions to these problems.

Pre-peeled potatoes for commercial use are not new. In fact, they date back to the mid "thirties," and except for a set-back during the World War II period, the trade that produces them has been a constantly expanding one. Conservatively, it is estimated that the pre-peeling trade now uses close to 2 million bushels of potatoes annually. First produced for the restaurant trade, they are now going to hotels, hospitals and other institutions. In fact, proposed U.S. Standards for grades for pre-peeled potatoes were issued on September 5, 1953 following industry requests for their establishment. There are pre-peeling plants in nearly every metropolitan area of the country.

Behind the growth of the pre-peeled potato trade there is a good economic basis. In a recent study made by Michigan State College in co-operation with the National Restaurant Association it was found that it costs considerably more per pound to hand peel potatoes in a restaurant than it does to do the job in an abrasive type mechanical peeler. In a

commercial pre-peeling plant this spread is wider since there are other economies in addition to less peeling waste in a large centralized operation. Even with mechanical equipment, potato losses in small-scale peeling operations can run as high as 40 percent, as compared with 20 to 25 percent in a commercial peeling plant.

R. H. Treadway and R. L. Olson, respectively of the Eastern and Western Regional Research Laboratories, Bureau of Agricultural and Industrial Chemistry, USDA, have made a quite comprehensive study of the commercial pre-peeled potato trade and contributed materially to this article. In a recent paper, they pointed out that restaurateurs have found it good business to pay 4 to 6 cents a pound above the price of unpeeled potatoes for the pre-peeled product and cite these reasons:

(1) Savings in labor and cost of equipment; (2) savings in storage space; (3) reduction in garbage; (4) availability of peeled potatoes, particularly French-fry slices; (5) peeling loss is known since it is paid in advance; (6) the pre-peeled product is of better quality than ordinary unpeeled potatoes; and (7) prices of the pre-peeled product are more stable.

Pre-Peeling Has Its Risks

Right here it might be well to interject a note of warning to those who may be getting too rosy a picture of the pre-peeling trade. There have been frequent changes in the trade and a number of firms have tried it and failed; not unusual for any new type of business. However, there are indications that the industry has stabilized and the better processors have survived the introductory phase. Most of them had a very good background in the marketing and handling of potatoes.

Such experience is essential to successful operation. A pre-peeler must know his spuds; the varieties that are best suited to various types of cooking and those that react best to the different methods of peeling. He must be a good judge of quality since it has a direct bearing on his processing costs, which include peeling and trimming losses, labor expenses and waste from rot. He must know how to handle potatoes, know storage methods, and how to recondition potatoes properly after extended storage. And, of course, he must know how and when to buy, since acting as a purchasing agent is part of the service he sells along with his pre-peeled product.

Other Economies

Before potatoes are peeled in a commercial operation, it has been found that it pays to separate them by size. The largest can be sold at a premium for baking; very small ones may not be economical to peel; and in certain peeling operations it is more efficient to peel potatoes of the same size at the same time.

There are three major types of peeling used at present in the commercial trade - steam, lye, and abrasion. Each has its advantages and disadvantages, and you can get an argument from the processors using them as to which is best. Here is what Dr. Treadway and Dr. Olson have to say about the three methods:

"It is likely that the advantages and disadvantages of these three methods of peeling make one about as good as another. Some large operators feel that steam and lye peeling are more economical than abrasion, since they remove less of the tissue underneath the skin. . . . The original investment for equipment is usually higher for steam and lye peeling than for abrasion peeling. . . .

Danger of Overheating

"High-temperature operations (steam and lye) must be closely controlled to avoid cooking the potato tissue to excessive depth. This would be unobjectionable in potatoes that are to be cooked immediately in a food processing plant, but a cooked surface is undesirable in a product to be merchandised as raw, pre-peeled potatoes."

"Varietal characteristics are such that some potatoes (notably, the White Rose variety) cannot be used for mashed potatoes following high-temperature peeling and a few days' storage. The cooked layer becomes so tough that it will not break up in mashing operations and leaves undesirable lumps. Replacement of expensive equipment and even business failure have resulted from the difficulties of maintaining a high-quality peeled potato with high-temperature peeling methods."

"In lye peeling, operations must also be so controlled as to leave no perceptible alkali after the peeled potatoes are washed. Various types of potato discoloration, sometimes accompanying lye peeling, constitute still another problem.

"Although peeling losses in abrasion peeling are frequently large, this method is usually preferred by smaller processors because the equipment is not only less expensive but more nearly foolproof."

Prevention of Discoloration

Anyone who has peeled potatoes and let them sit for a while knows that they turn brown and finally dark gray or black. Briefly, this is caused by oxidation of certain substances in the potato juice. It can be prevented by dipping the peeled potatoes in a solution of bisulfite salt or sulfur dioxide. As a guide, a dip of 30 seconds in a solution of .5 percent sodium bisulfite and .5 percent citric acid, a solution which gives sulfur dioxide, is recommended by BAIC. A longer dipping time or more bisulfite in the solution will strengthen the preservative action, but over-treatment may cause an off-flavor. Excessive acid may cause juice to leak from the product.

Although the Federal Food and Drug Administration requires that food treated with sulfur dioxide be so labeled when destined for sale in interstate commerce, use of the chemical is permitted provided it is not used to conceal damage or inferiority. Several States have additional restrictions on use of sulfur dioxide. But, there is precedent for use of sulfur dioxide and sulfites in foodstuffs such as maraschino cherries, molasses, dried fruits and wines, where they are used as preservatives, or to help in protecting the color.

There also are secret trade processes for treating potatoes, which, while more expensive than use of the solutions suggested above, are claimed to cause no off-flavor. In addition several manufacturers turn out equipment for a continuous, mechanized production line for pre-peeling, which includes sorting, washing, peeling, conveyor belt to trimming and cutting, and dipping to prevent discoloration.

After potatoes have been treated to stabilize color, they are drained, sometimes exposed to a draft of air to remove excess surface water, bagged, and weighed. For the commercial trade usually they are packed in 30-, 35-, and 60-pound packages, boxes or bags, with an inner moisture-proof liner.

Handling Recommendations

BAIC recommends, regardless of the type of packaging used, three principles that should be followed in handling pre-peeled potatoes until they are used: (1) they should be kept cool in a temperature range from 32 to 40 degrees; (2) the container should be relatively impermeable to gases and tightly closed; and (3) dehydration of the product should be avoided. High quality potatoes, processed properly, containing residual sulfur dioxide in the neighborhood of 100 parts per million, should be expected to remain in good condition a week.

Maintenance of high standards of sanitation during processing and handling, is stressed by BAIC, since failure to observe this undoubtedly contributed to the failure of some processors.

Pre-Peelers Offer Other Products

In addition to pre-peeled potatoes, some operators in the trade are furnishing restaurants and canners a ready-to-use mix of such vegetables as potatoes, onions and carrots, or other vegetable combinations, for use in hashes, soups, and stews. Sliced potatoes for French-frying in a "par-fried" (partially fried) form recently have been introduced for the restaurant trade. The potatoes are not dipped in solution but are blanched in hot oil and fried for several minutes until they start to turn brown. Drained, packaged, and kept under refrigeration until used, they are ready after 1 to 2 minutes final frying in the restaurant. Because of their ease of preparation, a much lower moisture content than uncooked potatoes, and their fat content, the "par-fried" product usually sells for twice the price of uncooked pre-peeled potatoes.

More Research Needed

Research, which probably would hasten the day when pre-peeled potatoes could successfully be retailed, according to Dr. Treadway and Dr. Olson, should cover: (1) the best type of packaging material; (2) consumer preference in package size or sizes; (3) the type of peeled potato most desired; and (4) the price relationship and competition relative to other fresh and processed vegetables. Other general questions to be answered are what the maximum and minimum sizes of an economical peeling plant should be and what area can be covered in servicing wholesale customers by trucks.

Definite Measurements For Wool Classes

By E. M. Pohle

A system of classing grease wool, with staple lengths designated in inches for each grade, will be proposed for consideration of the wool industry in a report which will be released soon by the U. S. Department of Agriculture.

The report is expected to develop considerable interest in the wool trade since it suggests a change in the current practice of indicating length classes for the various grades of wool by substituting inch measurements for the length nomenclature now in use.

The authors of the report, technologists in the Denver Wool Laboratory of the Production and Marketing Administration, stress that the proposed class measurements are suggested "subject to discussion and possible modification." At the same time, however, they emphasize that adoption of the measured staple length designations should be of benefit to practically everyone engaged in wool marketing.

Basis of Recommendation

Wool is marketed on the basis of grade (degree of fineness of the fiber) and class (the length of staple or fiber within each grade). There are 6 principal market grades of wool ranging from "Fine" to "Common or Braid" and a varying number of length classes for each grade. Grading and classing are usually done in the same operation.

While grading of wool for fineness is recognized as the most important step in preparing wools for market or processing, length of staple also is very important since it is a physical characteristic which determines what the wool can be used for, its conversion cost, and its ability to produce the type and character of yarn or end product desired. To the producer it also influences the amount of clean wool contained in a fleece and therefore is important in any sheep and wool improvement program.

At present, the length classes used to indicate variations in length of staple within a grade are indefinite as to measured specifications. The terms used to describe them - Staple, Good French Combing, Average French, Short French, and Clothing and Stubby - generally are familiar only to those engaged in marketing or working closely with wool.

To secure information which would aid in the development of a system of classifying grease wool by length for marketing purposes and to bet-

ter define the commercial length terminology, a study of staple length of wool was undertaken by PMA's Livestock Branch at the Denver Wool Laboratory. During the course of the investigation, 149 lots of graded grease wool totaling 2,683,000 pounds, representing all commercial grades and covering wool clips from 1946 to 1949, inclusive of both Territory and Fleece wools, were examined.

On the basis of this study, interviews with members of the wool trade, and previous laboratory investigations, the report suggests, "subject to discussion and modification," the following grease wool staple length designations in inches for the various grades of wool:

Commercial Length Classes	Fine	1/2-Blood	3/8-Blood	1/4-Blood	Low 1/4-Blood	Common
Staple	2.5" & Longer	3.0" & Longer	3.5" & Longer	4" & Longer	4.5" & Longer	5" & Longer
Good French Combing	2.0	2.5	3	3.5	--	--
Aver. French	1.5	2.0	2.0	2.5	--	--
Short French	1.0	1.5	--	--	--	--
Clothing & Stubby	Under 1.0"	Under 1.5"	Under 2.0"	Under 2.5"	Under 4.5"	Under 5.0"

The report points out that the staple length figure in each case is based on unstretched staple length, and represents a minimum length for the bulk of the staples in a lot. This further explanation is added: "The staple length for the bulk portion of a fleece should determine the average for the fleece. Combinations or length groupings may be made from the length designations as desired. For example, perhaps a fine grade lot of wool is composed of fleeces that range in length from 2, 2.25, 2.5 and 3 inches. This could be called Good French and Staple; or a lot that has lengths from 1.5 to 2.5 inches may be called Average to Good French."

With respect to the benefits to be derived from use of the suggested new classing system, the report states that adoption of measured staple length designations for the various grades of wool should aid producers and others by providing (a) a uniform yardstick by which fleeces may be classed for length when they are graded; (b) better understanding of length requirements in preparing wools for market; (c) a more objective basis for equitable trading and for evaluating differences between fleeces and/or clips of wool; (d) a guide to breeders and producers in selecting breeding stock; (e) a basis for the Market News Service to report sales and prices; and (f) assistance to producers in interpreting market quotations.

What About Grain Storage?

By A. F. Troyer

One of the major problems growing out of this year's near record grain harvests is storage space for the abundant crops. Added to a carry-over that was the second largest in the history of our country was a new crop bringing the total wheat supply to 1.7 billion bushels, as compared with 1.6 billion last year. The carryover of corn plus the estimated new crop amounts to 4 billion bushels - several hundred thousand bushels above last year's total supply of 3.8 billion bushels. The 1953 crop and carryover of oats adds up to 1.5 billion bushels and barley will require storage space for .3 billion bushels.

How can this grain be stored? Where can it be stored? Who is storing it? How can more storage space be provided?

Here are the answers to these and other questions on grain storage which explain current U. S. Department of Agriculture and other Federal programs which offer incentives to construct new grain storage space; provide for emergency storage; assist producers who cannot find immediate storage; and encourage orderly marketing.

Q. What are the incentives the Department is offering to encourage construction of new commercial grain storage?

A. USDA has made an offer to responsible commercial firms, including cooperatives, to guarantee the use of new grain storage facilities which are erected in areas where additional storage space is needed. Roughly, the Commodity Credit Corporation offers three types of guarantees for new storage constructed under the program: (1) 75 percent of occupancy for 3 years and 40 percent for the next 2 years; (2) 60 percent occupancy for 5 years; or (3) 50 percent occupancy for 6 years.

Q. What help is provided farmers who want and need on-farm storage but feel that they haven't the ready money to construct it?

A. This probably is one of the most effective of the USDA programs. Last May announcement was made that the time in which farmers can obtain CCC loans to finance a major part of the construction cost of on-farm storage facilities for grains and other storable crops had been extended to June 30, 1954. These loans are available to owner-operators, tenants, landlords, or partnerships who put up storage facilities meeting the requirements for storage of commodities under the price support program.

Q. How much time do farmers have to repay these loans?

A. Loans are payable in 4 annual installments, or earlier at the option of the borrower. The first installment is due twelve months after the loan is made. The interest rate is 4 percent.

Q. Is the Government providing any other encouragement to people who construct new grain storage facilities?

A. Yes, the Bureau of Internal Revenue administers a law, enacted by the past session of Congress to encourage new storage construction. This legislation permits a speedy write-off of the cost of building storage by allowing it to be amortized over a 60-month period for Federal income tax purposes. This is in lieu of the present depreciation deduction for tax purposes which is spread over the useful life of the property. The law applies to construction of both commercial and on-farm storage facilities.

Q. Just how would this help a farmer who builds new storage space?

A. Previously, if a farmer built new corn cribs or other grain storage facilities, the cost of the construction could be deducted from his taxes, but it had to be done over the period of the useful life of the property. Now it may be written-off in five years, which makes for a substantial tax reduction.

Q. What other steps is USDA taking to relieve the grain storage situation?

A. There are three other activities: The CCC grain storage bin program, the emergency storage program using idle U.S. merchant ships, and the CCC "reseal" program designed to keep grains under government loan in present storage on farms.

Q. How large is the CCC grain storage bin program?

A. On September 15, USDA announced that 16,520 bins, with a total capacity of approximately 96 million bushels had been purchased. Many have been erected. Others have been shipped to locations in Illinois, Iowa, Kansas, Michigan, Minnesota, Nebraska, Ohio, South Dakota and Wisconsin. This brings the total capacity of storage structures owned by CCC to about 640 million bushels.

Q. How many ships are being used for grain storage?

A. Seventy-five ships of the reserve fleet were loaded with grain at New York City and returned to anchorage at Jones Point, N. Y. Another 50 ships were loaded at Baltimore and Norfolk and returned to the James River anchorage.

Q. How much do these ships hold?

A. They hold an average of 225,000 bushels each. More could be stored in them, but space was left to insure adequate inspection and fumigation and provide for operation of the aerating system with which all of the ships are equipped.

Q. What is the "reseal" program?

A. Price support loans made on grain fall due about the time another year's crop is being harvested. CCC offered to extend these loans on 1952 corn and wheat stored on farms in specified States for a year, under the same terms as the existing loan, and to pay a storage fee to farmers of 14 or 15 cents a bushel on wheat and 13 cents on corn. The storage fee is payable when the farmer turns the grain over to CCC at the end of the extended loan period.

Q. Do the same provisions cover purchase agreements?

A. About the same. Farmers may change their purchase agreements over to a loan on the grain they have stored on the farm and the loan is extended under the research program.

Q. How much of these two grains have been resealed?

A. There were about 3 million bushels of wheat resealed through August 15. Of course, the resealing of that crop is just ending and a final report is not available. The resealing period for corn is just beginning. But last year over 415 million bushels of 1952-crop corn was put under price support.

Q. What measures were taken to relieve wheat farmers whose harvests came in before storage was available.

A. Price support loans have been made available in designated "distress areas" of the principal wheat growing States east of the Rockies, where temporary facilities are to be had. These distress loans are made at 80 percent of the official price support level.

Q. For how long a period are these loans made?

A. They will run for a 90-day period. During this time the farmer must obtain adequate on-farm or commercial storage. This done, he can put his wheat under loan at the full 90 percent of parity.

* * *

"FEEDING MOLASSES TO LIVESTOCK"

Valuable information on molasses for livestock feed, including its use, handling and distribution, is contained in a USDA bulletin prepared by the Sugar Branch, PMA. The publication is based upon molasses feeding tests carried out at State experiment stations and the Bureau of Animal Industry, USDA, on marketing research studies by the Sugar Branch, and on the experience of many farmers who feed the product.

Advantages of feeding molasses, recommended amounts to be fed directly and with other feeds, sources of various types of molasses, methods of delivery, equipment needed to handle molasses on farms, and suggested methods of on-farm distribution are some highlights of the publication.

The bulletin is available from the Office of Information Services, PMA, U. S. Department of Agriculture, Washington 25, D. C.

New USDA Cleaner-Mixer Speeds Cottonseed Grading

By M. E. Whitten

Better, faster, and cheaper preparation of cottonseed for grade analysis is possible through use of a new mechanical "cleaner-mixer" recently developed by specialists of the U. S. Department of Agriculture. A public patent for the equipment is being sought by the Department.

In extensive tests, it has been found that the new device which is operated by a small electric motor cuts the time for cleaning and mixing cottonseed samples by 50 to 90 percent from the hand methods now in use. In addition, it mixes samples more uniformly and removes foreign matter more efficiently. Accuracy of analysis is increased since the machine cleans uniformly whereas hand cleaning is dependent upon the efficiency of individual operators, who usually are unskilled workers.

Accurate sampling is a primary requisite for determining the quality of any product. Official U. S. Standards for grading, sampling, and analyzing cottonseed sold or offered for crushing specify methods for drawing and preparing official samples. If reliable results are to be obtained, samples to be used as a basis for chemical analysis and grading must be uniformly drawn and prepared at oils mills as well as properly handled at the laboratory. Standard grading procedures require that cottonseed samples be thoroughly blended before a chemical analysis is made.

In hand cleaning methods now used, cottonseed samples are rubbed back and forth across a screen, which permits the foreign material in the seed to fall through the mesh. Larger particles such as sticks or burrs are picked out by hand. The seed is mixed in a separate operation. In the past, this method has been satisfactory for a large portion of cottonseed samples since they were relatively clean when received, but with seed containing much foreign matter hand cleaning can be cumbersome, time consuming and, therefore, expensive. Generally, 4 to 5 minutes are required to efficiently hand clean and mix samples of low foreign material content. Such samples are uniformly cleaned and mixed in 2 minutes with the USDA cleaner-mixer. Cottonseed with excessive foreign material which required 40 minutes for hand cleaning and mixing was handled by the cleaner-mixer in 4 minutes.

The new mechanical cleaner-mixer was developed by personnel of the Cotton Branch, Production and Marketing Administration, at the USDA Cotton Laboratory at Stoneville, Miss., after considerable research. A report, "A Mechanical Cleaner-Mixer for Cottonseed Samples," by the men who developed it, is available from the Office of Information Services, PMA, U. S. Department of Agriculture, Washington 25, D. C.



Figure 1. USDA cottonseed "cleaner-mixer" set up, ready for operation.

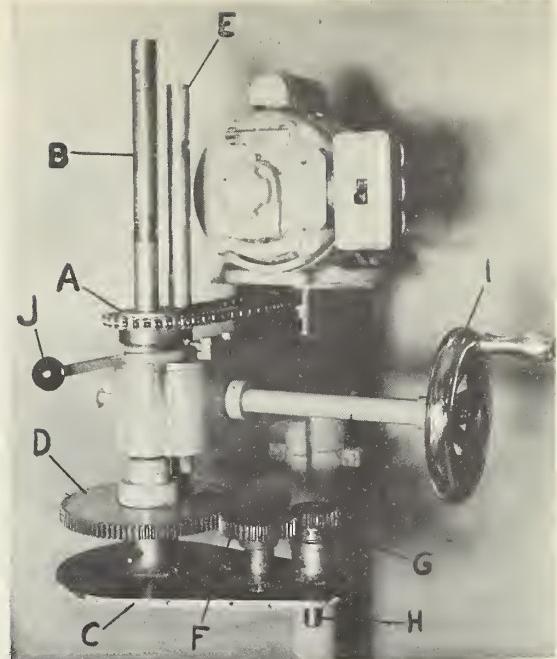


Figure 2. Mechanical detail of USDA cottonseed "cleaner-mixer," explained below.

Power for the cleaner-mixer is supplied by a small motor which has an output speed of 36 r.p.m. (See Figure 2, above). Power is transmitted by a chain to sprocket A which is mounted so that shaft B, which it turns, may move up and down. The shaft revolves gear-mounting plate C. Gear D is stationary being prevented from rotating by round rod E. Revolving action of gear-mounting plate C drives gears F and G around stationary gear D, thereby causing them to revolve. The cleaning-paddle assembly, mounted on shaft H, consists of a round plywood disc with rubber paddles on the lower side. The round rod E which holds gear D stationary has a rack cut on one side. The shaft on which handwheel I is mounted carries a pinion which meshes with this rack. Turning the handwheel moves the gear-mounting plate up and down, thereby raising and lowering the cleaning-paddle assembly. When the assembly is raised the cleaning pan can be easily removed or replaced. Lever J operates a lock which holds the paddle assembly in either an up or down position.

Use of the equipment is simple. A sample is weighed and placed in the cleaning pan. The paddle assembly is lowered and the motor turned on. At the end of 2 minutes it is turned off and a visual inspection is made. If foreign matter is visible the machine is run another minute. (Except for extremely dirty seed, 2 minutes has been found sufficient for cleaning as well as uniformly mixing.) When machine is stopped, paddle assembly is raised and cleaning pan is removed. If necessary, cleaned seed may be dumped on a piece of heavy paper where any large pieces of foreign matter can be picked out. Most trash is removed by the rubber paddles brushing the cottonseed back and forth across the perforated bottom of the cleaning pan. The trash drops through into pan below machine, where it can be collected to determine trash content.

Buttermilk Powder; Good Mixer

By T. I. Hedrick

Once used chiefly for livestock feed, a little known but high quality byproduct of the dairy industry is coming into its own as an important ingredient in a number of food products. This byproduct, spray-dried buttermilk, has the happy faculty of making a number of good foods even better and has great marketing potentialities.

Unfortunately, its true worth - its superiority for certain purposes in food manufacture as well as its natural food value - has not been completely recognized. With a better understanding of its uses and value and the production of a consistently high-grade product more effective merchandising and utilization of the commodity should be possible.

Spray dried buttermilk has been used very successfully in the manufacture of ice cream, sherbets, frozen desserts, cheese and other dairy food products. Other fields of use, some barely scratched yet, are the baking and confectionery trades and the production of ready-mixed cake, biscuit, waffle, and pancake flours. Still other markets may exist for use in dried soup mixes and for home use in consumer-sized packages.

The outstanding characteristic of spray-dried buttermilk is an inherent property which gives it a natural emulsifying characteristic--an ability to bring about the blending of fats with liquids and other food ingredients. Technically, this emulsifying ability is attributed to a phospholipid complex - a fat-like substance called lecithin - or a lecithin-protein complex present in the product. Dry buttermilk has a higher percentage of this material than most common dairy products.

Dried buttermilk, as such, is not a new product. In the past, however, it was principally roller-dried and was generally of inferior quality. Consequently, animal feed was its chief outlet.

With the trend to the marketing of whole milk rather than farm separated cream, a number of dairy plants realized the opportunity that existed to produce a high quality dried buttermilk. Other creamery managements, failing to appreciate the potential market for a high quality product, continued to handle buttermilk without regard to good sanitation or metallic contamination. If full advantage is to be taken of the markets that exist for high quality spray-dried buttermilk, faulty equipment and processing practices will have to be corrected. Good quality is essential for stimulation of larger demands.

There are two principal types of spray-dried buttermilk. The more common is sweet cream buttermilk powder, with an acidity varying from 0.10

to 0.16 percent (reconstituted). The other, referred to as high acid, cultured, or ripened buttermilk powder, is produced through the introduction of a lactic acid culture in sweet cream buttermilk prior to dehydration. Both types can be used in the manufacture of food products.

In the production of the powder, a uniform percentage of acidity from lot to lot is important if it is to be used for most food making purposes. Higher quality products can be made from sweet cream buttermilk which has not undergone chemical or bacterial deterioration prior to inoculation with lactic acid culture. A high quality powder also must be free from added neutralizing compounds.

Another important factor in producing buttermilk powder is consideration of its keeping quality. Deterioration prior to dehydration naturally affects this. Fat content of the powder, which usually varies from 4.5 to 12 percent, is conducive to rapid deterioration in regular storage. While H. H. Sommer, in the 5th edition of his "Theory and Practice of Ice Cream Making", reported that buttermilk powder would hold its quality only for two months, a good quality product held under favorable conditions should last longer. The cooler the storage temperature and the more moisture resistant the containers, the longer the product should have storage stability.

In the manufacture of dairy and related products, spray dried buttermilk has been used successfully in ice cream, sherbets and other frozen desserts; as an ingredient of process cheese, cheese spreads, and certain types of cheese; and in flavored dairy drinks and cultured beverages. Both sweet cream and high acid powder have been used to supply a portion of milk solids in sherbets, while the former type has been used extensively by some ice cream makers.

Ice Cream and Sherbets

Even roller-dried buttermilk has been used in ice cream. E. L. Thomas and W. B. Combs, in a "Journal of Dairy Science" article, reported that it gave a greater rate of whipping, usually 1 to 2 minutes. They added that freshly frozen ice cream so made was drier in appearance, had greater consistency, a richer flavor, and the melt-down from it was finer in structure and more stable. Mr. Sommer, in his book cited above, found that use of buttermilk in liquid, condensed, or powdered form is desirable if ice cream is of low fat content or made with butter. In the latter case, components normally present when cream is used would be restored.

Use of sweet cream buttermilk to supply nearly 20 percent of the serum solids of ice cream mix was reported on by J. H. Frandsen and D.H. Nelson in 1950. They found that larger amounts may have a slightly adverse effect on flavor. The author has found that by using a good quality spray-dried sweet cream powder to furnish the serum solids (11 percent) not furnished by sweet cream, ice cream flavor was not adversely affected. The percentage of milk solids-not-fat supplied by dried buttermilk varied from 20 to 50. Some spray dried powder from questionable sources did influence flavor in amounts of 25 percent or more even in chocolate flavored ice cream, but this powder was not a sweet cream product.

Technicians of the Bureau of Dairy Industry, D. H. Williams, F. E. Potter, and C. F. Hufnagel, in another "Journal of Dairy Science" article, have noted that spray-dried buttermilk solids derived from cream of good quality, produced satisfactory ice cream in concentrations of as high as 8 percent of the mix. But, objectionable off-flavors, excessive viscosity were noticed and improved whipping was not obtained if neutralized buttermilk solids replaced one-half of the normal milk-solids-not-fat.

As pointed out before both types of buttermilk powder can be used in sherbets and the natural stabilizing benefits supplied by the product in sherbet mix should be emphasized. In addition, the naturally produced lactic acid in the high acid type powder would replace an equivalent amount of the acid usually added to sherbets.

The recent appearance of many new brands of frozen desserts in certain markets suggests other possibilities for dry buttermilk sales; since it would appear to be a natural product to provide at least some of the solids in those frozen desserts based on vegetable fat. It is logical to assume the same benefits would apply as have been found in the use of buttermilk powder in ice cream made with butter or dry milk fat.

Cheese and Cheese Products

Laboratory experiments have indicated that spray dried sweet cream buttermilk not only can be used as part of the milk solids in making Neufchâtel and cream cheese, but its use seems to improve their flavor. However, use of dry buttermilk to provide more than 50 percent of the solids in these products adversely affects body and yields. Since cheese foods and spreads usually contain ingredients in addition to cheese, either sweet cream or high acid buttermilk powder could be used in their production. Although not much information is available studies have been made of the manufacture of these products with the amount of buttermilk powder used varying from 2 to 12 percent.

In dairy drinks it has been found that 1 to 3 percent of dried buttermilk reconstituted into low fat chocolate preparations gave a slightly richer flavor and aided in the stabilization of the suspension of cocoa particles. A limited number of trials also have indicated that recombined dry milk and milk fat have greater fat emulsion stability if 10 to 25 percent of the solids-not-fat are derived from spray-dried buttermilk.

Baking Uses Varied

The baking industry, the principal user of high-acid type buttermilk powder, offers good prospects for both types of dry buttermilk, since, as J. E. Crawford, in an article in "Bakers Weekly," has put it: "Buttermilk can improve the taste, texture, appearance, and nutritive value of nearly every product of the baker's oven."

The same article explained that buttermilk acts as a fermentation stabilizer providing dough with more tolerance towards changes in fermentation and allowing it to take more punishment in mixing and handling. The lecithin in buttermilk emulsifies the shortening used in bread dough

and gives it a smoother more uniform distribution. Because fresh buttermilk is difficult to obtain, varies in quality and uniformity, and deteriorates rapidly even under the best of conditions, a high quality buttermilk powder is a better product for the baker.

In bread-trial experiments, using 6 parts by weight of dry buttermilk in each 100 parts of flour, it was found that spray-dried powder gave a consistently larger loaf volume and roller-dried gave a slightly less consistent larger loaf volume in comparisons with dry milk solids, according to researchers at the University of Minnesota.

Where an acid product such as rye bread is desired, high acid type buttermilk has been used with excellent results. A. H. Johnson, in a "Food Industries" article, reported that use of high acid buttermilk powder, 5 percent on flour basis, gave rye bread a superior flavor, better external and internal character, crust with a richer bloom, more regular crumb structure and texture, brighter crumb color, and better slicing and keeping qualities. Many bakers use high acid buttermilk because it brings out the true rye flavor in rye bread. It also can be used to advantage in whole wheat bread. Bakers have used 3 to 6 percent high acid powder (based on flour) to produce a distinctive, pleasant flavor in white bread and in certain localities have built up a consumer preference for this loaf.

Other uses of the high acid powder in the baking trade include biscuits, cookies, chocolate cake, devil's food cake and other products, where it improves flavor and keeping quality. It not only intensifies chocolate flavor but develops deeper color in chocolate and fudge cakes.

Icing and Fillings

Sweet cream buttermilk powder has definite advantages in the baking trade for making icings, fillings, and coatings which have a more desirable flavor and smoother, more stable body. A satisfactory substitute whipping cream product is possible through the use of butter, spray-dried sweet cream buttermilk, flavoring, and water. This product has good whip stability and taste, in addition to its economy. Keeping quality of these dairy components and their availability offer pertinent advantages.

Other Fields of Use

In the ready-mixed or "dry mix" flour field, which is expanding rapidly, there should be opportunities to increase the demand for dry buttermilk. The same advantages and benefits realized by bakers should be available from use of approximately the same amounts of the powder in pancake, waffle, biscuit, and chocolate and Devil's Food cake mixes.

A larger market for sweet cream buttermilk powder should exist in the confectionery trade, which already uses large quantities of other dairy products. Since the trade also is a large consumer of commercially prepared lecithin, the natural supply of this compound in buttermilk powder should enhance its other qualities. Although available knowledge is limited, spray-dried buttermilk has been used in making hand-rolled creams,

chocolate coatings, and some of the trade name candies. It is useful in providing smoother emulsions and creamy bodies for confections.

Sweet cream buttermilk powder also has been successfully used in a few dried soup mixes, such as potato, pea, onion, etc., in amounts varying from 2 to 20 percent of the total ingredients. But in this field, as in the confectionery trade, further research is advisable to develop more information as to the optimum amounts of buttermilk powder that could be used to advantage.

There is a good possibility that a consumer-sized retail package of spray dried high acid buttermilk powder would have sales appeal. With the addition of just water, it would fill the need for buttermilk or sour milk required in many household recipes, but inconvenient or impossible to obtain in liquid form. Both types of powder, when reconstituted, make a refreshing, nutritious and easily digested drink.

In selling dry buttermilk, there has been some tendency to overlook the full value of its fat content, which can range from 2,025 to over 4,500 pounds in a 45,000 pound carload. At a value of 80 cents per pound for this fat content, less 17 cents per pound for the value of dried buttermilk solids-not-fat displaced by the fat, the fat value of a carload of buttermilk powder would range from about \$1,275 to \$2,835. Thus, value of the fat content of the product is worthy of consideration.

Possible uses of spray-dried buttermilk are large. However, the first concern should be the production of a high quality product. A merchandising program emphasizing the valuable properties of the powder in the fields outlined above could follow.

Marketing Briefs

(The program announcements summarized below are more completely covered in press releases which may be obtained on request from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C. by citing the code number given at the end of each item.)

Cotton.—Orderly marketing of 1953 crop cotton to avoid a harvest time market glut during September to November, has been urged by Secretary of Agriculture Ezra Taft Benson. It was pointed out that price support loans are available and storage facilities are ample in most areas. (USDA 2251-53)... Later, in answer to inquiries, the Secretary ruled out export subsidies for the 1953 crop. (USDA 2033-53)... USDA has offered 1953-crop COTTONSEED cake and meal taken under price support for sale at the support price or market price, whichever is higher. (USDA 2062-53)... CCC has sold 43,996 pounds of KENAF fiber (jute substitute) USDA 2078-53... Conditions for repurchase of COTTON LINTERS by cottonseed crushers have been announced. (USDA 2175-53), and CCC has discontinued other sales of the commodity. (USDA 2198-53)

Dairy.--USDA has sold 25,000,000 lbs. of NONFAT MILK POWDER to the United Nations Childrens Fund (USDA 2234-53); and is offering an additional 50,000,000 lbs. for donation to US private welfare agencies. (USDA 2201-53)... Purchases of EVAPORATED MILK for FAO shipment to Germany and NONFAT DRY MILK for the School Lunch Program have been made by USDA. (USDA 2057-53)... Action was taken during the past month on the following milk marketing orders: NEW YORK (USDA 2256-53 and 2024-53); NEOSHO VALLEY (USDA 2081-53 and 2044-53); CHICAGO (USDA 2145-53); CENTRAL MISSISSIPPI (USDA 2187-53); LOUISVILLE (USDA 2216-53); KANSAS CITY (USDA 2136-53); MINNEAPOLIS-ST.PAUL (USDA 2119-53); DETROIT (USDA 2118-53); CENTRAL WEST TEXAS (USDA 2048-53); TRI-STATE (Kentucky, West Virginia and Ohio) (USDA 2243-53); CINCINNATI (USDA 2238-53); MUSKEGON, Mich. (USDA 2146-53) and SPRINGFIELD, Mo. (USDA 2209-53)

Fruits and Vegetables.--POTATO marketing problems are to be discussed by a group from that industry scheduled to meet with USDA here on October 22. (USDA 2182-53)... Acreage and production guides for 14 WINTER VEGETABLE crops have been announced. (USDA 2054-53)... USDA has announced a program to encourage 1953-54 exports of RAISINS. (USDA 2095-53)... Standards for grades have been issued for FROZEN COOKED SQUASH (USDA 2164-53) and proposed for PEELED WHITE POTATOES (USDA 2173-53) and FROZEN CONCENTRATED LEMONADE (USDA 2046-53). Revised grade standards have been announced for CANNED APPLES (USDA 2245-53) and proposed for CUCUMBERS (USDA 2144-53)... Action was taken on the following marketing agreement orders: CALIFORNIA DRIED PRUNES (USDA 2122-53), Oregon and Washington FILBERTS (USDA 2110-53) and California ALMONDS. (USDA 2068-53)

Grain.--Secretary Benson has urged wheat farmers to use CCC loans rather than sacrifice their WHEAT at low market prices. (USDA 1961-53)... Earlier, the Secretary announced that no CCC wheat is being sold for export under loan rates. (USDA 2125-53)... The WHEAT Industry Advisory Committee has recommended discussion of two-price marketing for that commodity. (USDA 2025-53). Farmers approved marketing quotas for 1954 wheat crop. (USDA 2014-53). USDA, under certain conditions, will guarantee occupancy of new grain storage facilities to encourage their construction. (USDA 2019-53) RYE price support has been broadened to include lower test weight grain. (USDA 2155-53)... The maturity date has been advanced and the moisture allowance increased for 1953-crop price support BEANS. (USDA 2053-53). Offers to sell CCC-held COVER CROP, HAY and PASTURE SEED for export have been withdrawn. (USDA 2152-53)

Livestock.--Secretary Benson has advised sheep producers to avoid excessive LAMB marketing (USDA 2199-53), and later, extended the grazing period on lands administered by the Forest Service. (USDA 2228-53)... USDA has urged the food trade to push the use of BEEF during the period from mid-September through October. (USDA 2066-53). Through August 31, USDA had purchased a total of 7,935,835 lbs. of BEEF products (USDA 2188-53). Under an FAO requisition, 7,500,000 lbs. of LARD were purchased for shipment to Germany. (USDA 2036-53)... USDA has reported on livestock loans and sales of emergency feed in drought areas (USDA 2225-53) and again has included MIXED FEED in the Emergency Drought Program. (USDA 2165-53)... Sales prices for CCC-owned WOOL have been revised. (USDA 2142-53)

ABOUT MARKETING

The following addresses and publications, issued recently, may be obtained upon request. To order, check on this page the publications desired, detach and mail to the Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

Publications:

U. S. Standards for Fresh Tomatoes (Effective Sept. 14, 1953). Aug. 26, 1953. 9 pp. (PMA) (Processed)

Light Air-cured Tobacco Market Review, 1952 Crop (Part I - Type 31-Burley) (1952-53 Season). July 1953. 30 pp. (PMA) (Processed)

1954 Vegetable Guides Program (Winter Vegetables for Fresh Market) August 1953. 23 pp. (PMA) (Processed)

Wholesale Prices of Fresh Fruits and Vegetables and Auction Prices of Fresh Fruits at New York City and Chicago and F.O.B. Prices at Leading Shipping Points, by Months, 1952. August 1953. 38 pp. (PMA) (Printed)

The Test Weight Per Bushel of Grain: Methods of Use and Calibration of the Apparatus. Circular 921, June 1953. 11 pp. (PMA) (Printed)

Cottonseed Oil Mills: Their Comparative Efficiencies and Effects on Prices and Producers' Returns. AIB-103. June 1953. 27 pp. (PMA) (Printed)

Views of Independent Grocers on Wholesaler-Retailer Relations. Marketing Research Report No. 42. June 1953. 49 pp. (PMA) (Printed)

Visual Inspection of Products for Surface Characteristics in Grading Operations. Marketing Research Report No. 45. June 1953. 57 pp. (USDA in cooperation with University of California Institute of Engineering Research) (Printed)

Packaging and Displaying Meats in Self-Service Meat Markets. Marketing Research Report No. 44. June 1953. 86 pp. (PMA) (Printed)

The Marketing of Milk in the Louisville Area Under Federal Regulation. Marketing Research Report No. 43. June 1953. 323 pp. (PMA) (Printed)

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